NET, IAS, State-SET (KSET, WBSET, MPSET, etc.), GATE, CUET, Olympiads etc.: Physics MCQs (Practice_Test 22 of 35)

1. The gibb's function G in thermodynamics is defined as G = H-TS where H is the enthalpy, T is the temperature and S is the entropy.In an isothermal, isobaric, reversible process, G
   a. remains constant, but not zero
   b. varies linearly
   c. varies non-linearly
   d. is zero
2. Average of squares of displacements of particles in Brownian motion is
   a. Directly proportional to temperature-T
   b. directly proportional to viscosity-h
   c. Directly proportional to radius of the particle-a
   d. directly proportional to time-t
3. The order of magnitude of the mean free path of a diatomic molecule at STP is
   a. 1 cm
   b. 10 – 2 cm
   c. 10 – 5
   d. 10 – 8 cm
4. In the Vander Walls equation (p + a/v2) (v-b) = RT
   a. 'a' and 'b' are the corrections for the cohesive forces
   b. 'a' and 'b' are the corrections for the volume occupied by. The molecules
   c. 'a' is the correction for the cohesive forces and 'b' is the correction for the volume occupied by the molecules
   d. 'a' is the correction for the volume occupied by the molecules and 'b' is the correction for the cohesive forces
5. After Joule-Thomson expansion, the gas is
   a. always heated
   b. heated or cooled depending upon the initial temperature of the gas

c. neither heated nor cooled at any temperature

d. always cooled

6. If a black body radiation in a spherical cavity of volume V satisfies the relation, PVh = constant during a quasi-static isentropic process, then the numerical value of h should be

a. $\frac{7}{5}$

b. $\frac{5}{3}$

c. $\frac{4}{3}$

d. $\frac{3}{2}$

7. Consider the following statements regarding the paramagnetic materials:

a. Permanent magnetic moments interact with each other weakly.

b. Magnetization M varies inversely with absolute temperature T.

c. Magnetization M is much greater than the magnetic filed strength H.

d. Large permanent magnetization can be.Induced in these materials.

- Of these statements

a. 1 and 2 are correct

b. 2 and 4 are correct

c. 1,2 and 3 are correct

d. 1,3 and 4 are correct

8. If a Rowland ring of mean radius 0.1 m had 2000 turns of wire wound on a ferromagnetic core of h = 1000, then, for a magnetizing current of 1.5 A, the magnetic field in the core would be

a. 3 T

b. 6 T

c. 9 T

d. 12 T

9. The electric potential point (x, y) in the x-y plane is given by V =-kxy. The field intensity at a distance ‘r’ from the origin varies as

a. r2

b. r

c. 1/r

d. 1/r2

10. A fast electron having a kinetic energy of 3.0 × 10 − 17 Joule enters a region of space containing a uniform electric field of E = 1000 volts/m. The field is parallel to the

electron's motion and in a direction such as to decelerate it. The distance traveled by the electron before it is brought to rest (charge of electron = 1.6 × 10 − 19 C) will be

a. 1.875 cm

b. 18.75 cm

c. 187.5 cm

d. 1875 cm

11. At a point 20 cm from the centre of a uniformly k charged dielectric sphere of radius 10 cm, the electric field is 100 V/m. The electric field at3 cm from the centre of the sphere will be

a. 150 V/m

b. 125 V/m

c. 120 V/m

d. zero

12. Two identical charged spheres of density 2.4 gm/cm3 suspended from the same point by strings of equal length 1.5 m, make an angle of 30 degree in air. If suspended in a liquid of density 0.8 gm/cm3 the angle remains the same. The dielectric constant of the liquid is

a. 1.2

b. 1.5

c. 2.4

d. 3.0

13. Which one of the following statements regarding the electric fields E1 = xi + yi and E2 = xy2 i + y3 j is correct?

a. Both E1 and E2 can represent electrostatic field

b. Neither E1 nor E2 can represent electrostatic field

c. Only E1 can represent electrostatic field

d. Only E2 can represent electrostatic field

14. The equivalent capacitance of the given circuit is

a. 0.5 m f

b. 1 m f

c. 6.75 m f

d. 9 m f

15. Consider the following statements: In electronics, capacitors are used for

a. tuning the resonant circuits.

b. bypassing alternating voltages.

c. storing electrical energy in the form of magnetic field.

d. blocking D C voltages from parts of an electrical circuit.

- Of these statements
  a. 1,2 and 4 are correct
  b. 1 and 2 are correct
  c. 2,3 and 4 are correct
  d. 1 and 4 are correct